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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/821,151	03/29/2001	Joseph R. Summa	81017PCW	4261

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EXAMINER

NGUYEN, LUONG TRUNG

ART UNIT	PAPER NUMBER
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2612

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/821,151

Applicant(s)

SUMMA, JOSEPH R.

Examiner

LUONG T. NGUYEN

Art Unit

2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/07/2005 has been entered.

Response to Arguments

2. The Affidavit under 37 CFR 1.132 filed on 08/18/2005 is insufficient to overcome the rejection of claim 1 based upon Foster (US 6,643,386) and claims 2-5 based upon Foster (US 6,643,386) in view of Omori et al. (US JP 2000-260968) as set forth in the last Office action because:

The submitted evidence is insufficient to establish **diligence** from a date prior to the date of reduction to practice of Foster (US 6,643,386) and Omori et al. (US JP 2000-260968) references to either a constructive reduction to practice or an actual reduction to practice. Applicant must account for the entire period during which diligence is required and the period during which diligence is required must be accounted for by either affirmative acts or acceptance excuses. See MPEP § 2138.06.

For this reason, applicant's arguments filed on 08/18/2005 have been fully considered but they are not persuasive as to claims 1-5.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Foster (US 6,643,386).

Regarding claim 1, Foster discloses an image sensor (image sensor 50, figure 6, column 6, lines 1-2) comprising an array of pixels for collecting incident light and converting the light into an electrical charge (pixels, figure 6, column 6, lines 9-10); a color filter array having a plurality of colored filters positioned adjacent to the pixels for selectively transmitting specific spectral bands of light to the pixels (color filters 30, figure 6, column 6, lines 13-16, column 3, lines 48-62); a plurality of lenses (microlenses 38, 52, 54, figure 6) positioned adjacent to individual pixels wherein the lenses (microlenses 52, figure 6) positioned adjacent a first color of the colored filters are substantially larger in size than lenses (microlenses 38, figure 6) adjacent a second color, such that a greater portion of the incident light is focused onto the pixel adjacent the first color of the colored filter (figure 6, column 6, lines 1-17).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foster (US 6,643,386) in view of Omori et al. (JP 2000-260968).

Regarding claim 2, Foster fails to specifically disclose the color filters include a blue colored filter which is the first color in the color filter array. However, Foster discloses microlenses 52, which are positioned adjacent to a first color, are larger in size than microlenses 38 (figure 6, column 6, lines 1-17). And Omori et al. teaches that the sizes of the microlenses for low-sensitivity colors (for example, blue and red) larger than that of microlenses for a high-sensitivity color (for example, green), see Solution, and noted that blue is the lowest-sensitivity color among red and green colors. Therefore, the size of microlenses formed on the blue color filters are largest as compared to the size of microlenses formed on the red color filters and green color filters. Therefore, the microlenses 52 of Foster are formed on the blue colored filter. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Foster by the teaching of Omori et al. in order to reduce noise in the low-sensitivity colors (see Solution).

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Regarding claim 3, Foster discloses the colored filters include red and green colored filters either of which is the second color (figure 6).

Regarding claim 4, Foster fails to specifically disclose the color filters include a red colored filter which is the second color. However, Foster discloses microlenses 52, which are positioned adjacent to a first color, are larger in size than microlenses 38 (figure 6, column 6, lines 1-17). And Omori et al. teaches that the sizes of the microlenses for low-sensitivity colors (for example, blue and red) larger than that of microlenses for a high-sensitivity color (for example, green), see Solution, and noted that blue is the lowest-sensitivity color among red and green colors. Therefore, the size of microlenses formed on the blue color filters (first color) are largest as compared to the size of microlenses formed on the red color filters (second color) and green color filters (third color). Therefore, the microlenses 38 of Foster are formed on the red colored filter. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Foster by the teaching of Omori et al. in order to reduce noise in the low-sensitivity colors (see Solution).

Regarding claim 5, Foster discloses the colored filters include a green colored filter which is a third color and which lens adjacent green colored filter is substantially smaller than the red colored filter (the size of microlenses 54 are smallest as compared to the size of microlenses 38 and 52, figure 6, therefore the third color is green).

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7. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu (US 6,008,843) in view of Fossum et al. (US 6,137,100).

Regarding claim 1, Yu discloses an image sensor (CCD, figure 1b, column 1, lines 5-50) comprising an array of pixels for collecting incident light and converting the light into an electrical charge (photo diodes 11, figure 1b, column 1, lines 5-50); a color filter array having a plurality of colored filters positioned adjacent to the pixels for selectively transmitting specific spectral bands of light to the pixels (color filter layer 14, figure 1b, column 1, lines 35-39); a plurality of lenses (microlenses 15, figure 1b) positioned adjacent to individual pixels.

Yu fails to specifically disclose wherein the lenses positioned adjacent a first color of the colored filters are substantially larger in size than lenses adjacent a second color, such that a greater portion of the incident light is focused onto the pixel adjacent the first color of the colored filter. However, Yu discloses the size of microlens 15 corresponds to the size of Red, blue, green filter 14 (figure 1b). And Fossum et al. teaches a color image sensor, which includes the green filter 112 is smaller in size than blue color filter 110 (figure 1D, column 2, lines 53-59). This also indicates that the size of the lens positioned adjacent to blue color filter is larger in size than the size of the lens positioned adjacent to green color filter. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Yu by the teaching of Fossum et al. in order to provide an image sensor, which can improve the efficiency response of the low efficiency color, such as blue, green (column 2, lines 63-64).

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Regarding claim 2, Fossum et al. disclose the color filters include a blue colored filter which is the first color in the color filter array (blue color filter, figure 1B, column 2, lines 39-42).

Regarding claim 3, Fossum et al. discloses the colored filters include red and green colored filters either of which is the second color (figure 1B).

Regarding claim 4, Fossum et al. discloses the color filters include a red colored filter which is the second color (figure 1B).

Regarding claim 5, Fossum et al. discloses the colored filters include a green colored filter which is a third color and which lens adjacent green colored filter is substantially smaller than the red colored filter (figure 1B).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571) 272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NGOCYEN VU can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN
11/13/05



LUONG T. NGUYEN
PATENT EXAMINER